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Developing the Stress Resistance of Flight Dispatchers

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***Abstract*. The paper is devoted to the research of stress resistance of flight dispatchers. We consider stress resistance an integrative personal quality that is basic for productive professional activity in extreme conditions. The optimal (high) level of stress resistance can be considered the key professional quality of flight dispatchers because it permits them to stay resistant to disturbing factors, to keep their working efficiency during all working day and during all working tasks. Stress resistance can be considered one of the most important professional qualities of flight dispatchers as well as their professional knowledge and as well as their professional skills.**

Research objective – to study stress resistance of flight dispatchers, to create a model of the developing program for flight dispatchers and to check its effectiveness in experimental approbation of the program.

The hypothesis of our research is the following: by means of purposely organized and realized developing program based on our stress resistance model it is possible to affect the exponents of stress resistance of flight dispatchers and to achieve the optimal stress resistance level and as a result to form constructive coping strategies.

We consider that in practical work of aviation psychologists there are several important exponents of stress resistance such as neuro-psychic stability, neuro-psychic tension, stress level, professional stress tolerance.

In this research we organized a special developing program for flight dispatchers based on our model of stress resistance that we constructed.

The sample group of the research was 30 flight dispatchers working in Eastern Siberian Aero Navigation State Corporation that is responsible for air flight organization and safety in Eastern Siberia. 15 of them were included into control group as they have shown normal stress resistance and 15 of the whole sample group were included into experimental group as they have shown high stress level and low stress resistance.

After experimental approbation of this developing program we proved the high effectiveness of this program - most of flight dispatchers of the experimental group increased their exponents of stress resistance. The level of neuro-psychic tension significantly decreased, the level or neuro-psychic stability significantly increased, the stress level significantly decreased, professional stress tolerance significantly increased. In fact the program has shown its effectiveness towards all exponents of stress resistance of flight dispatchers. It gave us a possibility to recommend this program to all practical psychologists working in aviation and also to psychologists working with people who provide safety in any other kind of transport or industry field.

Keywords — stress, stress resistance, stress tolerance, flight dispatchers

I. INTRODUCTION

Air flight safety has been the subject of interest for all citizens in all countries at all stages of aviation development. Recent years questions of air flight safety are defined by means of conception of air flight security factors. ‘Human’ factor is considered the most important of them.

The effectiveness of flight dispatchers professional activity is defined not only by their professional knowledge and skills but also by the professionally important personal values, and stress resistance is the most important among them.

The problem of stress resistance has always been and still stays important in Psychology and it is defined by many social reasons. There are some types of professional activities in which stress resistance plays the key role in preventing catastrophic accidents and other damages caused by “human-machine” complexes. Flight dispatchers definitely do professional activity that always runs in very stressful conditions, and studies of their stress resistance will always be significant both for psychological practice and aviation.

In Psychology and Psychophysiology stress resistance is studied as the personal value that guarantees high level of productivity of any activity in extreme conditions. At the same time we don’t often see in contemporary investigations studying the process of how stress resistance can be developed during professional growth especially by means of special programs.

In this paper we describe our investigation devoted to experimental approbation of the effectiveness of the developing model of stress resistance for flight dispatchers whose professional activity is always held in very stressful conditions.

II. Stress resistance of flight dispatchers

Theoretical analysis concerning the problem of our study gave us the possibility to generalize several approaches to the subject (V.A. Bodrov's ideas of overcoming stress, O.B. Darvish' studies of stress resistance's structure, D.A. Evstigneev's research in aviation psychology, etc.) and to make a definition of stress resistance of flight dispatchers [1], [2], [3]. We define the stress resistance of flight dispatchers as an integrative personal quality that gives a possibility of highly productive professional activity of flight dispatchers whose professional activity always runs in extreme conditions.

The optimal level of stress resistance that permits a person to keep a stable workability being emotionally tensed is one of most important professional qualities of flight dispatchers [3], [4], [5]. D.A. Evstigneev, S.K. Nartova-Bochaver and K.K. Platonov consider high level of stress resistance as important in professional activity or flight dispatchers whose work is concerned to flight safety as their professional knowledge and their being professionally trained [3], [6], [7].

Practical psychologists in aviation normally use the following valuations of stress resistance: the first is neuro-psychic stability, the second is neuro-psychic tension level, the third is stress level and the fourth is professional stress tolerance, and these valuations can be also use related to flight dispatchers [8], [9].

In E.N. Talisina's summarizing research of recent investigations of psychological resistance she concludes that any resistance is a complex concept and a complex phenomenon, and stress resistance is a complex of psychological, psychophysiological, neuro-psychic exponents [10].

In R. Lasarus' and S. Folkman's researches we can see focus on emotional components of stress resistance and coping. They focus on the way a person makes conceptualization of emotions and coping when facing stressful situations [11], [12]

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The hypothesis of our research is the following: by means of purposely organized and realized developing program based on our stress resistance model it is possible to affect the exponents of stress resistance of flight dispatchers and to achieve the optimal stress resistance level and as a result to for constructive coping strategies.

III. Methods and techniques of the research

Base of a research: the practical work was realized on the basis of Eastern Siberian Aero Navigation State Corporation that is responsible for air flight organization and safety in Eastern Siberia.

We used the following diagnostic methods in this research: 1) PSM25 – Stress Scale, 2) Neuro-psychic tension questionnaire, 3) 'Professional Stress' questionnaire, 4) 'Prognosis' questionnaire.

Diagnostic measurements were analyzed by means of T-Wilcoxon Rank-Sum criterion.

Our practical research was taken through several stages. At the first stage 50 flight dispatchers took part. They were 35-45 years old, all male. At the second (experimental) stage of the research only 15 flight dispatchers took part because 20 flight dispatchers had shown the optimal level of stress resistance. These 15 flight dispatchers of experimental group had shown the middle and lower level of stress resistance and also the tendency of constant weakening of their stress resistance level, their valuations were confirmed by means of all diagnostic methods.

We included two parts in our developing program: the first part was theoretical and it included briefing to widen flight dispatchers' knowledge about stress resistance, stress tolerance and about how distressed process changes in dynamics and also the practical part of the program that included discussing the results of flight dispatchers' diagnostics, discussing special exercises and practice related to those exercises that were focused on affecting all exponents of stress resistance such as neuro-psychic stability, neuro-psychic tension level, stress level and professional stress tolerance.

The program constructed for developing stress resistance of flight dispatchers was built of 8 sessions - one session per week. The duration of the program was 2 months. Every session was programmed for 5 hours. In a month after finishing the program the post-experimental control diagnostics was done.

Describing the goals of the developing program several mini-goals should be mentioned:

1) to widen flight dispatchers knowledge about stress, distress, stress resistance, stress tolerance,

2) to teach flight dispatchers skills of defining their stress reactions in their professional activity,

3) to develop flight dispatchers' ideas and knowledge about coping strategies,

4) to form adequate emotional attitudes towards stress situations (stress is normal, stress should be fixed and faced, stress must be controlled, etc.),

5) to develop behavior that would be affective in stress situations. The special focus in the developing program was made on improving flight dispatchers' ideas about emotional resistance that affects all their psychological and somatic comfort.

The table 1 contains a brief scheme of the developing program model. It can be seen that the following blocks of the program were planned, organized and realized in the experiment: discussing block, developing block, integration block and resuming block.

TABLE I. THE MODEL OF DEVELOPING PROGRAMM FOR FLIGHT DISPATCHERS BY BLOCKS

THE MODEL OF DEVELOPING PROGRAM FOR FLIGHT DISPATCHERS	DISCUSSION BLOCK	Widening knowledge about stress, distress, stress resistance, stress tolerance, stress symptoms
	DEVELOPING BLOCK	Gaining new experience in stress analysis, developing new skills in stress resistance
	INTEGRATING BLOCK	Integration between new knowledge, new skills and real professional situations
	RESUMING BLOCK	Generalization of work results, findings, sharing

The main method of developing program for flight dispatchers was training method as it was considered very effective for working with emotional, personal, regulative and cognitive aspects of adequate coping strategies.

IV. Results and discussion

At the first stage of the research using interviewing and testing we tried to find out whether flight dispatchers had correct or wrong ideas about stress, distress, stress reactions, stress tolerance. In fact according to diagnostics 8% of flight dispatchers have absolutely wrong ideas about stress, distress, stress resistance. They were defining stress using other emotional conditions such as bad mood, tiredness etc. They didn't know much about ways of dealing with stress. In fact idea that there are some special methods to deal with stress was really new for them. Many of flight dispatchers didn't even know the symptoms and signals of distress; they didn't know how to define the situation when they are totally stressed. Their knowledge about stress and distress were full of stereotypes such as 'stress is bad', 'stress should be ignored when I'm at work', and in fact some of their ideas about stress were totally wrong. 52% of flight dispatchers have shown right knowledge about stress, distress, stress resistance. They could define what real stress was, they could give correct definitions and they named correct symptoms of distress. Other 40% of flight dispatchers have shown middle level of knowledge about stress, distress, stress resistance. They had correct ideas about it in general but often made mistakes in details and concrete symptoms. They could define what stress was, they could define also professional situations that could cause stress. 50% of flight dispatchers could define stress looking at their colleagues, they could describe what a person can feel being in stress but in fact they couldn't properly define their own emotions and senses when they are stressed themselves. So all in all 48% of our flight dispatchers (nearly a half of the whole sample group) had wrong or partly wrong ideas about stress and everything related to it.

Then we decided to check whether some of our flight dispatchers were under professional stress at the moment of the research. 36% of flight dispatchers appeared to have low level of professional stress. Their answers about all symptoms of professional stress were mostly 'sometimes' or 'rare'. We suppose that lower level of professional stress of these flight dispatchers can be related to their high stress resistance and their high readiness for stress situation and with their rich experience in dealing with stress at work. Other 64% of flight dispatchers were under high professional stress at the moment of the research. These respondents answering the questions about professional stress and distress often used the answers like 'very often', 'always', 'almost always'. Answering the question 'how often do you feel tiredness being at work' these flight dispatchers mostly answered 'very often'. They said that very often they couldn't really afford the whole massive off incoming information at the workplace and it makes them very stressed.

Discussing results of PCM 25 Stress Scale we should mention that there were no flight dispatchers with high stress according to this method. All flight dispatchers were divided into two parts - with lower stress level (40%) and with middle stress level (60%). Although this questionnaire didn't find any flight dispatchers with really high stress level we suppose that even middle stress level is not really a good thing for our respondents because many flight dispatchers from this 'middle stress' group at the interview were saying about being mostly anxious at work, they complained about problems with sleeping, they were very irritated with their families and with colleagues and they were always worried about the future. Also they said that from time to time (on a regular basis) they suffered from headaches and from digestion problems. At the same time at the workplace they said they were very attentive and they didn't make any mistakes at their professional functions. So we concluded that they might need help although they were not in a crisis at the moment of the research.

Results of the questionnaire of neuro-psychic tension again let us divide all flight dispatchers into two groups. 38% of flight dispatchers have shown the low level of neuro-psychic tension. These respondents are really psychologically and somatically healthy, they feel psychological comfort most of the time at work. Most probably they don't have really any somatic pains, any extra muscle tonus, nothing like insomnia or indigestion. They feel confidence about themselves, they don't have many regrets about their mistakes in the past. They don't have really loud voices, their speech is not very fast, they feel relaxed most of the time, they show stability. The second group of flight dispatchers (62%) have middle exponents of neuro-psychic tension. They feel mobilized and ready for work, they have really good experience in facing stress, they have middle experience of tension, they have not bad mood most of the time, but at the same time they much more often than the previous group have over-energy periods, they were often irritated with their colleagues and very sensitive concerning any problems at work. Also they were much more sensitive to disturbing them when being at workplace.

The concluding step of the diagnostic was devoted to 'Prognosis' method. The results of this method let us make the following conclusion: 38% of flight dispatchers had shown the high level of neuro- psychic stability. This result shows that most of them are intolerant to stress and intolerant to extreme professional situations, their adaptivity can be damaged if the stress is too high. 62% of flight dispatchers have shown the middle level of neuro-psychic stability. They are more or less adaptive to new professional and new personal situations and sometimes they're able to compensate their stress with something productive.

So after all diagnostics analysis the experimental group was formed – it consisted of 15 flight dispatchers with worse diagnostic results.

Average values of stress resistance components of flight dispatchers of experimental group before and after developing program are presented on figure 1.

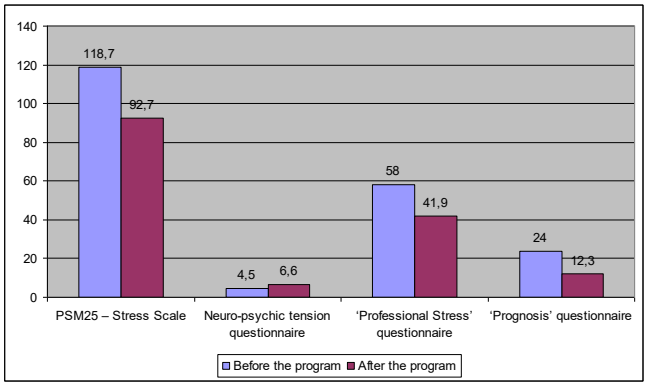

Fig. 1. Average values of stress resistance components of flight dispatchers of experimental group before and after developing program.

In tables II and III statistical slides before and after experiment for both groups are presented.

TABLE II. STATISTICAL SLIDES IN CONTROL GROUP

Diagnostic methods	T-Wilcoxon Rank-Sum criterion	Statistical significance
PSM25 – Stress Scale	-,199[b]	-
Neuro-psychic tension questionnaire	-1,107[c]	-
'Professional Stress' questionnaire	-,725[b]	-
'Prognosis' questionnaire	-,819[b]	-

TABLE III. STATISTICAL SLIDES IN EXPERIMENTAL GROUP

Diagnostic methods	T-Wilcoxon Rank-Sum criterion	Statistical significance
PSM25 – Stress Scale	-3,422[b]	**0,001**
Neuro-psychic tension questionnaire	-3,412[b]	**0,001**
'Professional Stress' questionnaire	-3,296[b]	**0,001**
'Prognosis' questionnaire	-3,420[b]	**0,001**

It is very vivid from these tables that experimental groups were showing only significant slides while control group has shown none of them. It gives us the reason to conclude that the hypothesis of the research was successfully verified and the experiment was effective.

V. CONCLUSIONS

The developing program for fight dispatchers that we organized and approbated in our experiment has shown its high effectiveness. As a result of the developing program flight dispatchers appeared the higher level of knowledge about stress, distress, stress resistance, stress tolerance and other terms of stress Psychology, also they received new knowledge and skills about how to deal with stress situations. Positive changers also took part in their emotional attitude towards stress: instead of fear and anxiety they already had shown their readiness to deal with stress and to understand it concrete symptoms. Statistically significant slides were fixed at the control stage of the program. Neuro-psychic stability of flight dispatchers increased, stress level of flight dispatchers decreased, professional stress decreased, the level of neuro-psychic tension decreased. The fact that all of these exponents were fixed in a month after finishing the program gives us the reason to say that the results of the program were very stable. Also we suppose that these results will be useful for flight dispatchers in the future because they will form their new professional skills and new level of their professionalism in general.

REFERENCES

[1] Bodrov V.A. «Psychological stress: development and overcoming». Moscow, Per Se, 2006. 352 p.

[2] Darvish O.B. «Psychological peculiarities of stress resistance of personality in extreme conditions» // Psychological Science and Education, #1, www.psyedu.ru / ISSN: 2074-5885 / 2012.

[3] Evstigneev D.A. «Aviation Psychology for flight dispatchers». Ulyanovsk, 2005. 137 p.

[4] Ilyina E.P. «Risk Psychology». St. Petersburg, 2012. 288 p.

[5] Maklakov A.G. «Personality Adaptation Potential: its mobilization and prognosis in extreme conditions» // Psychological Journal, 2001. - #1 (22).

[6] Nartova-Bochaver S.K. «Copingbehavior» among Personality Psychology terms // Psychological journal, 1997. - #5. pp. 34-37.

[7] Platonov K.K. «Introduction to Aviation Psychology». – Moscow: Transport, 1987. – 224 p.

[8] «Manual for psychological accompaniment of pilots and flight dispatchers of civil aviation in Russian Federaion» / Ministry of Transport of Russian Federation. – Moscow: Air Transport, 2001. pp. 166-191.

[9] Smirnov V.A. «Psychological aspects of air flight authorities». – Moscow: Military Edition, 1987. – 80 p.

[10] Talisina E.N. «Analysis of approaches towards psychological resistance' researches in Russian Psychology». - Moscow, FSB of Russian Federation MINIT, 2008, #7, pp.10-16.

[11] Lasarus R. Emotions and interpersonal relationships: towards a person-centered conceptualization of emotions and coping // Journal of Personality. 2006. Vol. 74, N 1. P. 9–43.

[12] Lasarus R., Folkman S. Stress, appraisal and coping. New York: Springer, 1984.